Pervasive and Personal Learning Environments

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1 Introduction

The Learning Management Systems (LMS) have become a mandatory element of the institutional policy to support teaching and training in the academic and corporate world. They offer the possibility to organize the learning material and activities and the learners registration and progress through the material. However, all learning does not occur through the LMS. This is particularly true when one considers lifelong learning and workplace learning. The development of the Web 2.0 phenomenon has enabled the emergence of the so called Personal Learning Environments (PLE). A PLE is an opportunistic and ad hoc use of multiple Web 2.0 services to support a personal learning goal. LMS are starting to integrate Web 2.0 services to complement their service offer, however, they will never be able to follow the rapid development and emergence of new services on the Internet. For this reason, we think necessary to support a kind of integration between the two worlds that enable the organisation of learning by teachers while harnessing the richness of the Web 2.0 world. Another dimension of the evolution of learning is the use of pervasive technologies that enable true situated learning. By enabling access and production of information on the spot and taking into account the context it provides a natural fit for learning in situ in the workplace. It is also a means to extend the learning activities outside of the classroom environment. In this position paper, we balance the LMS versus PLE approach. Based on that, we open a discussion about the convergence of institutional learning, Personal Learning Environments and pervasive technologies.

2 LMS versus Personal Learning Environment

2.1 The LMS

The Learning Management Systems provide an integrated solution for the organisation of learning and teaching. Their main functions consist of providing access to resources in a structured way (i.e., a Content Management System), managing course registration and monitoring learners activities and results. As a result these systems are organised following the institutional needs rather that the learners' needs. This approach as raised criticism in light of the advent of Web 2.0 and social software and the activities they enable [9, 8, 4]. The main critics that are done are the following:

- *A closed world* where the tools and data are integrated and structured according to the course organisation without any possibility to change anything.
- *Institutionally oriented* with very little consideration for individual learners' needs and asymmetric roles between the teacher and the learner.
- *Limited scope and access.* Resources are mostly available based on registration and for a limited period (e.g., academic year).

2.2 Web 2.0 and social software

The Web 2.0 "revolution" is rather a change in the use than a drastic change in the core Internet technologies. Usability improvement provided by technologies like Ajax and personal and collaborative publication services facilitate the production and management of information by anybody. Social aspects provide support for the emergence of communities and social treatment of the huge quantity of information produced. In the scope of e-learning, Web 2.0 technologies are deemed for their support for constructivist pedagogy because of the ease of information production and management at an individual or collective level [7]. It would be unfair to say that LMS do not support constructivist pedagogy but their closed world is surely restricting appropriation by the learner and thus does bring less motivation than expected.

2.3 The Personal Learning Environment

The PLE builds on the Web 2.0 services and social software. It is definitely user-centered. A PLE aggregates services that will help a learner manage information and relationships on a learning topic. According to Wilson, it is rather a pattern (of use) rather than a platform [9]. However some works have emerged that aim at providing a supporting infrastructure for the building of PLEs. PLEX is an early prototype that integrates information from many existing Web 2.0 services in a desktop application [1]. Other works provide a browser based environment like PLEF [3] and MUPPLE [6].

3 Towards a Pervasive Personal Learning Environment

The fast evolution of technologies and their convergence enable to imagine what would be a pervasive and personal learning environment. In this environment, a learner could fulfil personal and institutionally led learning goals. For this, he would be able to choose the right environment according to his preferences by selecting appropriate services. These services integrate well with the institutional services. So, when an activity is completed within the personal environment, it is taken into account at the institutional level. These activities and access to information can be done on a desktop environment but also through mobile and pervasive devices [2]. The context of the activity can then be used by the learning environment to provide the more pertinent information and activities.

The main technical drivers for this to emerge are the following:

- Open data format and open APIs, facilitate the integration of services and the management of data across the services.
- more and more Web 2.0 services can provide semantic information about their use and content. This will enable semantic search of the most pertinent information as well as the capability to monitor activities occurring through the services.
- pervasive computing and mobile devices contribute anywhere, anytime access to information as well as to the definition of the context of learning. Location based services are the most obvious example of that.

Based on that technologies it is necessary to build a framework that takes benefit of context and semantic information to support learners' activities as well as monitoring facilities that can be used to support learning by tutors. The framework should allow the combination of services and offer the means to aggregate information and activities across the services. The institution could then foster learning goals and activities through this environment [5].

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